REMARKS

I. Status of the Claims

Claims 1, 2, and 5-14 are currently pending. No claims have been amended by this response.

II. Rejections Under 35 U.S.C. § 103

1. Garrett in view of Ueno and Gaku

Claims 1, 5, 6, and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,437,026 to Garrett ("Garrett"), in view of U.S. Patent No. 4,606,960 to Ueno et al. ("Ueno") and U.S. Patent No. 4,904,760 to Gaku et al. ("Gaku"). (Office Action, pg. 2.) Applicants respectfully traverse the rejection for at least the reasons that (1) the reference combination fails to teach or suggest all the claimed limitations, and (2) there would have been no motivation for the proposed combination. Additionally, (3) the rejection of claim 9 is further flawed for at least the reason that it is based unsupported speculation concerning alleged inherent properties.

In the present rejection, the Office cites Garrett for disclosing an EMC forming method and the use of silane coupling agents to improve adhesion between silica and epoxy resin. (Office Action, pg. 3.) The Office admits that Garrett fails to teach plasma polymerization coating of silica. (*Id.*) The Office cites Ueno for disclosing "that treating the surface of reinforcing fillers such as glass fibers ... by coating the glass fibers using plasma polymerization ... [using] a monomer such as pyrrole... improve[s] adhesion of glass fibers to ... epoxy resins ...." (Office Action, pg. 3 (emphasis in original).) The Office cites Gaku for disclosing that "glass fibers [are] suitable for use as reinforcing fillers in thermosetting resins." (Office Action, pg. 3.)

The Office then concludes that it would have been obvious to use Ueno's plasma polymerization with Garrett's silica because (1) Ueno "teach[es] that plasma treating of reinforcing fillers such as glass fibers improves adhesiveness to epoxy resins," and (2) Gaku "teach[es] that glass fibers suitable for the use as reinforcing fillers in thermosetting resins include silica glass fibers." (Office Action, pg. 3-4.) Applicants respectfully disagree for at least the following reasons.

First, the reference combination does not teach or suggest all the limitations of the presently claimed invention. In fact, the Office's characterization of Ueno as disclosing plasma polymerization of glass fibers is fundamentally incorrect. As set forth in its Abstract, Ueno is direct to a method comprising "modifying the surface of a fiber of polyester which shows anisotrophy in the molten state ...." (Ueno, Abstract (emphasis added).) The only mention of glass fibers is in the background section, where Ueno simply states that glass fibers are among known reinforcing materials. (Ueno, col. 1, ln. 11-14 ("Fibrous materials which are known as a reinforcing material suitable to be used in composite materials include glass fibers, carbon fibers, alumina fibers, steel fibers and aramid fibers.").) Immediately thereafter, and uniformly throughout its disclosure, Ueno is specifically addressed to a particular species of polyester fibers.

In particular, Ueno is directed to "polyesters [that] show anisotropy in the molten state and give, by melt spinning, fibers exhibiting a high tenacity and a high modulus of elasticity." (Ueno, col. 1, ln. 14-19.) A problem with these polyester fibers identified by Ueno is that "when a composite material was formed by using various kinds of thermosetting resins or thermoplastic resins as the matrix and using a fiber formed of the polyester showing anisotropy in the molten state ... the adhesion ... is not

sufficiently good ...." (Ueno, col. 1, ln. 23-35 (emphasis added).) Ueno addresses this problem by "modifying the surface of a fiber of a polyester which shows anisotropy in the molten state by subjecting the fiber to a low-temperature plasma irradiation." (Ueno, col. 1, ln. 43-47 (emphasis added).) Throughout the remainder of the disclosure, the only fibers addressed by Ueno are these polyester fibers that show anisotropy in the molten state. (*E.g.*, col. 1, ln. 48 – col. 2, ln. 19.) Indeed, claim 1 of Ueno, the sole independent claim, is expressly directed to: "A method for treating fibers which comprises modifying the surface of a fiber of a wholly aromatic polyester which shows anistropy in the molten state by subjecting the fiber to a low-temperature plasma irradiation." (Ueno, col. 6, ln. 49-53 (emphasis added).)

Thus, contrary to the premise of the present rejection, there is no disclosure in Ueno directed to "treating the surface of ... glass fibers ... by coating the glass fibers using plasma polymerization ... to improve adhesion of glass fibers to ... epoxy resins...." (Office Action, pg. 3 (emphasis in original).) Therefore, for at least the reason that the references, taken together, fail to teach or suggest "coating the surface of said silica by plasma polymerization," as set forth in present claim 1, and claims 5-9 that depend there from.

Second, there would have been no motivation for the proposed combination. The purpose of Ueno, as expressly and repeatedly disclosed therein, is to solve a problem with a particular polyester fibers: "a fiber formed of the polyester showing anisotropy in the molten state." (Ueno, col. 1, ln. 23-35 (emphasis added).) Although Ueno mentions glass fibers in the general context of known fibers (col. 1, ln. 11-14), there is absolutely no mention of deficiencies with using glass fibers as reinforcing

materials. Indeed, the Office relies on Gaku for allegedly disclosing that "glass fibers [are] suitable for use as reinforcing fillers in thermosetting resins" (Office Action, pg. 3 (emphasis added)), which, in substance, is an admission that according to Gaku there was no known deficiency with using glass fibers as reinforcing materials. That is, according to Gaku, glass fibers, without any further treatment or processing, are already suitable. Thus, since none of the references identify any deficiencies in using glass fibers as reinforcing materials, there would have been no reason to further modify glass fibers with a plasma process according to Ueno. In other words, there would have been no motivation to plasma process glass fibers because, according to the references on which the Office relies, there are no known defects in using glass fibers that need to be, or would be, solved. The rejection is thus legally deficient for the addition reason that there would have been no motivation to combine the references, as proposed by the Office.

Third, with respect to claim 9, the Office has taken the position that the proposed combination would inherently be effective to enhance flexural strength. (Office Action, pg. 4.) No evidentiary support is provided for this assertions, except the characterization of the reference combination as entailing "a method identical or substantially identical" to the claimed invention. (*Id.*) For example, the Office has not shown that the combination yields a method identical to the claimed method. Nor has the Office shown that the proposed combination yields a method so close to the claimed method that the inference of inherency is justified. Accordingly, should the present rejection be maintained, the Office is respectfully requested to (A) cite an evidentiary basis for the assertion that the proposed combination would inherently be effective to

enhance flexural strength, or (B) provide an affidavit under 37 CFR § 1.104(d)(2) with an attestation that the information is based on facts with the personal knowledge of the Examiner. Absent such evidence, the rejection is unsupported and should be withdrawn.

2. Garrett in view of Ueno, Gaku, and Nakayama

Claims 2, 10, 11, and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Garrett in view of Ueno and Gaku and further in view of U.S. Patent No. 4,619,861 to Nakayama et al. ("Nakayama"). (Office Action, pg. 4.) Applicants respectfully traverse the rejection for at least (1) the reasons discussed in section 1 above, (2) the failure of reference combination to teach or suggest all the limitations of the claimed invention, and (3) the Office's reliance on an unsupported "routine optimization" theory.

The Office admits that Garrett in view of Ueno and Gaku fails to teach (a) charging silica into a plasma polymerization reactor, (b) vacuuming to $1x10^{-3}$ torr, (c) introducing the monomer, and (d) rotating the reactor at 1-50 rpm at plasma polymerization conditions (i) plasma power 10-40 W, (ii) gas pressure 40-50 mtorr, and (iii) treatment time 20-40 seconds. (Office Action, pg. 4.)

The Office cites Nakayama for disclosing (a) charging particles into a plasma polymerization reactor, (b) "vacuuming the reactor to $1x10^{-2}$ torr or more," (c) introducing a monomer, and (d) rotating the reactor at 20-70 rpm . (Office Action, pg. 4.) The Office does not cite Nakayama for disclosing (i) plasma power 10-40 W, (ii) gas pressure 40-50 mtorr, and (iii) treatment time 20-40 seconds. (*Id.*) The Office alleges only that "power level and treatment time are result-effective parameters in plasma

polymerization coating process," and that the discovery of optimal ranges is not inventive. (Office Action, pg. 5.)

First, this rejection is in error for at least the reasons discussed above for Garrett in view of Ueno and Gaku, because Nakayama has not been cited for and does not overcome the identified deficiencies concerning (1) surface modifying silica, or (2) motivation to use plasma polymerization to surface modify silica.

Second, none of the references are cited for teaching or suggesting "wherein said silica has an average diameter of 25-35 μm," as set forth in present claim 2, and claims 10-14 which depend there from. The rejection is thus in error for at least the reason that this limitation is not taught or suggested by the reference combination.

Further, Nakayama does not disclose plasma polymerization reactor charging, "followed by vacuuming to $\underline{1 \times 10^{-3} \text{ torr}}$," as set forth in present claim 2, and claims 10-14 which depend there from. As accurately cited by the Office, Nakayama does refer to a vacuum of "10^{-2} Torr or more." (Col. 5, ln. 23-24.) However, this is not a teaching or suggestion of 10^{-3} Torr as claimed. Although it is not clear what, if any, reliance the Office is placing on the "or more" language, it seems clear that Nakayama does not unambiguously teach or suggest a lower vacuum pressure, such as 10^{-3} Torr. Thus, since Nakayama is the only reference even cited by the Office for vacuuming to a given pressure, the reference combination as a whole also does not teach or suggest this limitation.

Third, the Office's allegation that "power level and treatment time are result-effective parameters in plasma polymerization coating process" (Office Action, pg. 5), is unsupported by any evidence of record. As argued with respect to the now withdrawn

rejection over France (U.S. Patent No. 6,428,861) in view of Drauglis (U.S. Patent No. 4,374,717) (December 23, 2003, Amendment, pg. 11-13, incorporated herein by reference), optimization of a variable cannot be considered routine unless the variable was previously recognized as result effective. *In re Antonie*, 559 F.2d 618, 195 USPQ 9 (C.C.P.A. 1977) (internal citations omitted). In the present case, the Office has cited no evidence to show that power level and treatment time (either individually, or in combination) were recognized as result effective variables. Absent such evidence, the rejection is improper and should be withdrawn.

3. Garrett in view of Ueno, Gaku, and Elmer

Claims 7 and 8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Garrett in view of Ueno and Gaku and further in view of U.S. Patent No. 4,690,107 to Emler et al. ("Emler"). (Office Action, pg. 5.) Applicants respectfully traverse.

For this rejection, the Office cites Elmer for allegedly teaching "that reinforced epoxy masses can be molded using a silicone rubber mold." (Office Action, pg. 6.) Elmer is not cited for overcoming and does overcome the deficiencies note above concerning Garrett in view of Ueno and Gaku (section 1, above). Accordingly, for at least the reasons that the references (1) fail to teach or suggest surface modifying silica, and (2) fail to provide motivation to use plasma polymerization to surface modify silica, the rejection is in error and should be withdrawn.

4. Garrett in view of Ueno, Gaku, Nakayama, and Elmer

Claims 12 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Garrett in view of Ueno and Gaku and further in view of Nakayama and Emler. (Office Action, pg. 6.) Applicants respectfully traverse.

For this rejection, the Office relies on Elmer for allegedly teaching "that reinforced epoxy masses can be molded using a silicone rubber mold." (Office Action, pg. 6.) Elmer is not cited for overcoming and does not overcome the deficiencies note above concerning Garrett in view of Ueno, Gaku, and Nakayama (section 2, above). Accordingly, for at least the reasons that the references (1) fail to teach or suggest surface modifying silica, (2) fail to provide motivation to use plasma polymerization to surface modify silica, and (3) fail to teach or suggest the claimed plasma operating conditions, the rejection is in error and should be withdrawn.

Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully requests the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

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By: _____
Mark J. Feldstein
Reg. No. 46,693